



Antibacterial effect of TiO₂ and ZnO vs Ag nanoparticles on some Pathogenic and phyto-pathogenic bacterial strains

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Abstract:

In the past century, the widespread strategy to prevent microbial contamination and to kill microorganisms consisted in adding antibiotics. However, the emergence of bacterial resistance to antibiotics has prompted researchers to turn to alternative solutions. The antibacterial activities of some nanoparticles make them attractive candidates as new agents against pathogenic bacteria. In the present work, antibacterial effects of nanoparticles are measured with cylinder diffusion technique, liquid and agar nutrient medium are used for bacterial culture. Antibacterial effects of concentration 0.1, 0.5, 1 and 1.5% of TiO₂ and ZnO nanoparticles are used in the three analyzed bacterial strains were known for their resistant to a lot of antibiotics. Inhibition zone measurement showed an interesting result, the maximum inhibition zone (12 mm) was observed in 1.5% of ZnO nanoparticles against *Staphylococcus aureus*. Based on this study, we showed that 60 nm ZnO nanoparticles have a smaller MIC than silver nanoparticles having a diameter between 8 and 40 nm against *Staphylococcus*. The nanoparticles of TiO₂ with 13 nm of diameter showed a better MIC against *Salmonella sp* compared to the silver nanoparticles, and inhibit also the phytopathogenic bacteria of the species *Dickeya solani*.



Biography:

Selma Allouache completed Phd in Université de Bejaia, Alegria she is bilingual proficient in English. Area of expertise: Cardiovascular, Haematology, Oncology, Immunology, Respiratory and Dermatology.

Publication of speakers:

1. Allouache, Selma & Bendali, Farida & Azarkan, Mohamed & Mostefaoui, Toufik. (2019). Purification of *Dickeya solani*-Asparaginase and Study of the Influence of TiO₂ and ZnO Nanoparticles on Its Enzymatic Activity. *BioNanoScience*. 10. 10.1007/s12668-019-00706-z.
2. Allouache, Selma & Mostefaoui, Toufik & Zaidi, R.. (2015). Les Effets du TiO₂ sur l'activité de la L-Asparaginase purifiée a partir de quelques souches de *Pectobacterium carovotorum* et *Dickeya solani*. Allouache, Selma & Rachida, zaidi. (2012). Production de l'asparaginase par deux souches bactériennes *Pectobacterium c. ssp carovotorum* et *Dickeya sp*.

Webinar on Medical and Pharmaceutical Sciences

Citation: Selma Allouache.; Antibacterial effect of TiO₂ and ZnO vs Ag nanoparticles on some Pathogenic and phytopathogenic bacterial strains; Euro Medical Pharma 2020; October 05, 202; UK Time zone